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DIVISION 10 - SPECIALTIES

SECTION 10270R

*4 RAISED FLOOR SYSTEM

01/97

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SECTION 10270R

*4 RAISED FLOOR SYSTEM
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PART 1 GENERAL

1.1 WORK DESCRIPTION

A. Work of this section includes, but is not limited to: access floor panels, floor coverings, understructure and various electrical, data and communication accessories. The raised floor system shall be the standard product of a manufacturer specializing in the manufacture of raised floor systems.

1.2 RELATED SECTIONS

A. General contractor shall provide clear access, dry secure storage, and a clean sub-floor area which is free of construction debris and other trades during installation of the access floor system. Area to receive the access floor shall be enclosed and be maintained at a temperature range of 50(to 90(F and a humidity range of 20% to 70% relative. Access floor must be stored in this environment at least 24 hours before the installation begins.

B. Concrete sealer shall be compatible with pedestal adhesive, see Division 3.

C. Electrical contractor shall provide necessary material and labor to electrically connect the access floor to the building, see Division 16.

1.3 PERFORMANCE REQUIREMENTS

Pedestals:

A. Axial Load: Pedestal assembly shall provide a 6000 lb. axial load without permanent deformation.

B. Overturning Moment: Pedestal assembly shall provide an average overturning moment of 1000 in-lbs. when glued to a clean, sound, uncoated concrete surface. ICBO number for the specific system or structural calculations shall be required attesting to the lateral stability of the system under seismic conditions.

Floor Panels:

A. Concentrated Load: Panel shall be capable of supporting a concentrated load of 1000 lbs. placed on a one square inch area (using a round or square indentor) at any location on the panel with a maximum top surface deflection of 0.100 inches. Panel shall not exceed a permanent set of 0.010 inches, after the load is removed. Panel shall demonstrate ductility by being loaded to a deflection of 0.100 inches without incurring damage.

B. Uniform Load: Panel shall be capable of supporting a uniform load of 250 lbs. placed on a one square foot area at any location on the panel with a maximum top surface deflection of 0.060 inches. Panel shall not exceed a

permanent set of 0.010 inches, after the load is removed. Note: The uniform load rating of an access floor panel as specified herein should not be confused with the "uniform live load" as specified in seismic zone applications.

C. Ultimate Load: Panel shall be capable of withstanding a concentrated load of 3250 lbs. applied onto a one square inch area (using a round or square indentor) at any location on the panel without failure. Failure is defined as the point at which the panel will no longer accept the load. Certified test report shall be shall be provided attesting to this ultimate load.

D. Rolling Load: Panel and supporting understructure shall be able to withstand the following rolling loads at any location on the panel without developing a local and overall surface deformation greater than 0.040 inches. Note: wheel 1 and wheel 2 tests shall be performed on two separate panels.

Wheel 1: Size: 3" dia x 1 13/16" wide Load: 800 lbs. Passes: 10
Wheel 2: Size: 6" dia x 1 1/2" wide Load: 600 lbs. Passes: 10,000

E. Impact Load: Panel and supporting understructure shall be capable of supporting an impact load of 100 lbs. dropped from a height of 36 inches onto a one square inch area (using a round or square indentor) at any location on the panel, after which it shall continue to meet all load performance requirements as previously defined.

F. Panel Drop Test: Panel shall be capable of being dropped face up onto to a concrete slab from a height of 36", after which it shall continue to meet all load performance requirements as previously defined.

G. Panel Cutout: Panel with 8" diameter cutout shall be capable of withstanding an ultimate load without failure of 1500 lbs. anywhere on the panel.

1.4 DESIGN REQUIREMENTS

A. Access floor system, where indicated on the design documents, shall consist of modular and removable cementitious filled welded steel panels fastened onto, and supported by, adjustable height pedestal assemblies. Pedestal head and panel corner design must provide a positive location and lateral engagement of the panel to the understructure support system without the use of fasteners.

B. Panel shall be easily removed by one person with a lifting device and shall be interchangeable except where cut for special conditions.

C. Quantities, finished floor heights (FFH) and location of accessories shall be as specified on the contract drawings.

1.5 SUBMITTALS FOR REVIEW

A. Detail sheets, for each proposed product type, which provide the necessary information to describe the product and its performance.

B. Test reports, by an independent testing laboratory within the U.S. with minimum 5 years experience testing, certifying that component parts perform as specified.

1.6 SUBMITTALS FOR INFORMATION

A. Manufacturer's installation instructions and guidelines.

B. Manufacturer's Owner Manual outlining recommended care and maintenance procedures.

1.7 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Raised Floor System

Drawings showing layout of the work, sizes and details of components, details at floor perimeter, bracing to resist seismic or other lateral loads, typical cutout details including size and shape limitation, method of grounding, description of shop coating, and installation height above structural floor.

SD-03 Product Data

Raised Floor System

Manufacturer's descriptive data, catalog cuts, and installation instructions. The data shall include information about any design and production techniques, procedures and policies used to conserve energy, reduce material, improve waste management or incorporate green building/recycled products into the manufacturer of their components or products. Cleaning and maintenance instructions shall be included. Design calculations which demonstrate that the proposed floor system meets requirements for seismic loading, prepared in accordance with subparagraph Underfloor Bracing under paragraph PANEL SUPPORT SYSTEM and ICBO UBC. Certified copies of test reports may be submitted in lieu of calculations.

SD-04 Samples

Raised Floor System; G, RE

One sample of each panel type and suspension system proposed for use.

SD-06 Test Reports

Tests;
Testing of Electrical Resistance;

Certified copies of test reports from an approved testing laboratory, attesting that the proposed floor system components meet the performance requirements specified.

SD-07 Certificates

Raised Floor System

Certificate of compliance attesting that the raised floor system meets specification requirements.

1.8 DELIVERY, STORAGE, AND HANDLING

Materials shall be stored in original protective packaging in a safe, dry, and clean location and shall be handled in a manner to prevent damage. Panels shall be stored at temperatures between 40 and 90 degrees F, and between 20 percent and 70 percent humidity.

1.9 EXTRA MATERIALS

Spare floor panels, and spare complete pedestal assemblies shall be furnished at the rate of one space for each 100 or fraction thereof required.

1.10 OPERATION AND MAINTENANCE MANUALS

Provide maintenance instructions for proper care of the floor panel surface. When conductive flooring is specified, require submittal of maintenance instructions to identify special cleaning and maintenance requirements to maintain "conductivity" properties of the panel finish.

PART 2 PRODUCTS

2.1 RAISED FLOOR SYSTEMS

A. Alternative products shall meet or exceed the feature requirements as indicated herein and the performance requirements as outlined in section 1.4 and must receive prior written approval by the Contracting Officer.
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C. Quality Assurance Source Limitations: Obtain access flooring through one source from a ~~single domestic~~ manufacturer who has a minimum of 5 years experience in the manufacture and distribution of access floor systems and can demonstrate that they have completed projects of like scope and size. ~~Access panels shall be stamped "Made in USA".~~ Any alternate products shall meet or exceed the requirements outlined herein.

2.2 SUPPORT COMPONENTS

Pedestals:

A. Pedestal assemblies shall be corrosive resistant, all steel welded construction, and shall provide an adjustment range of +/- 1" for finished floor heights 6" or greater.

B. Pedestal assemblies shall provide a means of leveling and locking the assembly at a selected height, which requires deliberate action to change height setting and prevents vibration displacement.

C. Pedestal head shall be designed with locating tabs and integral shape to interface with the panel for positive lateral retention and positioning without fasteners.

D. Galvanized steel pedestal head shall be welded to a threaded rod which

includes a specially designed adjusting nut. The nut shall provide location lugs to engage the pedestal base assembly, such that deliberate action is required to change the height setting.

E. Threaded rod shall provide a specially designed anti-rotation device, such that when the head assembly is engaged in the base assembly, the head cannot freely rotate (for FFH of 6" or greater).

F. Pedestal base assembly shall consist of a formed galvanized steel plate with no less than 16 inches of bearing area, welded to a 7/8" square galvanized steel tube and shall be designed to engage the head assembly.

2.3 PANEL COMPONENTS/FLOOR PANELS

A. Panels shall consist of a top steel sheet welded to a formed steel bottom pan filled internally by a lightweight cementitious material. Mechanical or adhesive methods for attachment of the steel top and bottom sheets are unacceptable.

B. Cementitious fill material shall be totally encased within the steel welded shell except where cut for special conditions. Note: This greatly reduces the potential for dust in the environment from exposed cement materials.

C. Panel shall have an electrically conductive epoxy paint finish.

D. Corner of panel shall have a locating tab and integral shape design to interface with the pedestal head for positive lateral retention and positioning with or without fasteners.

E. Fastening of panels to pedestal heads shall be accomplished by the use of a machine screw which is specially designed to be self capturing within the body of the panel. Note: This prevents the inadvertent loss of panel fastening screws when accessing the underfloor space and potential damage to objects by screws which extend beyond the depth of the panel.
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~~F. Top surface of the panel shall have option for four positioning location holes to engage positioning buttons on the carpet tile for precise matching of the carpet tile to the panel.~~

G. Fit between the pedestal head, panel, and screw shall enable an installation with an average panel to panel gap of 0.015".

2.4 ACCESSORIES

A. Modular Wiring System

1. Modular power system shall ensure efficient electrification and delivery of power from power panels to workstations or equipment at any location. System shall be prefabricated and totally flexible, with true "plug and play"

2. Modular wiring system is based on zone wiring requirements. Power distribution is achieved above the ceiling or below the access floor through use of multi-conductor open power cables run from circuit breaker panel to prewired master power distribution modules. This method of wiring eliminates need for individual home run cabling. Master power distribution modules branch out to feed satellite power distribution modules by modular connectorized closed power cables, in hierarchy scheme. From zone

locations closed power cables distribute power to any point where electrical power is required.

3. Modular connectors shall accommodate up to 10 conductors and employ following safety features:

a) Mating connectors shall be of locking type and be keyed by physical or mechanical means to maintain correct polarity, consistent with wiring diagram affixed to system components.

b) Grounding conductor contact on each modular assembly shall be designed and manufactured to provide for First Make / Last Break (FM/LB) feature, such that grounding connection is made before contact being made with current carrying conductors when connectors are mated. Grounding conductor shall break its connection only after current carrying conductors have broken their connections when connectors are disengaged.

c) Contacts of 10-pin connector shall conform to MIL-STD-202, 204 Cond. A, and 213 Cond. A to ensure durability and UL 486A for crimp retention force.

d) Plastic housings encase contacts within modular connector.

1. UL flammability rating of 94VO.

2. Genderless and keyed to prevent possible mismatching of dissimilar voltages.

3. Color coded to match industry-standard wiring colors (for example, green, black, red, blue, white, and grey) to aid in system installation and troubleshooting.

B. UL listed access floor outlet boxes shall be provided in locations as detailed on the contract drawings. High capacity 11 1/4 inch square service outlet boxes shall be capable of accommodating four duplex receptacles, six individual voice/data termination points or four individual voice/data termination points and one grommet opening. Standard capacity 7-5/16 by 6-15/16 inch service outlet boxes shall be capable of accommodating two duplex receptacles and four individual voice data/termination points or two individual voice/data termination points and one grommet opening. The service outlet box shall be a drop-in design having a hinged lid with carpet insert and frame with tapered edge. Service outlet box shall be capable of withstanding without failure a load of 800 lb.

C. Provide manufacturer's standard steps, ramps, fascia plate, perimeter support, and grommets where indicated on the contract drawings.

D. Provide 5% spare floor panels for each type used in the project for maintenance stock. Deliver to project in manufacturer's standard packaging clearly marked with the contents.

E. Provide 3 panel lifting devices.

2.5 FINISHES

A. Finish the surface of floor panels with floor covering material as indicated on the contract drawings. Where floor coverings are by the access floor manufacturer, the type, color and pattern shall be selected from manufacturer's standard.

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B. Carpet tile: Access floor system shall be designed ~~as option~~ to accommodate ~~a~~ modular carpet tile that ~~precisely~~ matches one carpet tile to one panel. ~~This is accomplished utilizing four precisely located positioning buttons on the carpet tile which engage into four positioning location holes within the top surface of the access floor panel.~~ The carpet tile's durable backing maintains dimensional stability, and holds the carpet tile flat without adhesives. Adhesives are not necessary and shall not be permitted on the installation except where the carpet is cut~~and more than two positioners are removed~~.

C. Vinyl edge trim for factory applied VCT and all other tile coverings shall be applied to the panel's top surface and shall not wrap around the panel's edge.

2.6 FABRICATION TOLERANCES

A. Floor panel flatness: +/- 0.040" diagonally
+/- 0.025" along perimeter edges

B. Floor panel width or length tolerance: +/- 0.010"

C. Floor panel squareness: +/- 0.015"

2.7 UNDERFLOOR BRACING

Special bracing to resist the effects of seismic or other forces shall be in accordance with Section 13080 SEISMIC PROTECTION FOR MISCELLANEOUS EQUIPMENT.

2.8 TESTS

Raised flooring shall be factory tested by an independent laboratory at the same position and maximum design elevation and in the same arrangement as shown on the drawings for installation so as to duplicate service conditions as much as possible.

PART 3 EXECUTION

3.1 INSTALLATION

The floor system shall be installed in accordance with the manufacturer's instructions and with the approved detail drawings. Open ends of the floor, where the floor system does not abut wall or other construction, shall have positive anchorage and rigid support. Areas to receive raised flooring shall be maintained between 60 and 90 degrees F, and between 20 percent and 70 percent humidity for 24 hours prior to and during installation.

3.1.1 Preparation for Installation

The area in which the floor system is to be installed shall be cleared of all debris. Structural floor surfaces shall be thoroughly cleaned and all dust shall be removed. Floor coatings required for dust or vapor control shall be installed prior to installation of pedestals only if the pedestal adhesive will not damage the coating. If the coating and adhesive are not compatible, the coating shall be applied after the pedestals have been installed and the adhesive has cured.

3.1.2 Pedestals

Pedestals shall be accurately spaced, and shall be set plumb and in true alignment. Base plates shall be in full and firm contact with the structural floor, and shall be secured to the structural floor with adhesive.

3.2 TESTING OF ELECTRICAL RESISTANCE

Testing of electrical resistance in the completed installation shall be conducted in the presence of the Contracting Officer. Testing shall be in accordance with NFPA 99 modified by placing one electrode on the center of the panel surface and connecting the other electrode to the metal flooring support. Measurements shall be made at five or more locations. Each measurement shall be the average of five readings of 15 seconds duration at each location. During the tests, relative humidity shall be 45 to 55 percent and temperature shall be 69 to 75 degrees F. The panels used in the testing will be selected at random and will include two panels most distant from the ground connection. Electrical resistance shall be measured with instruments that are accurate within 2 percent and that have been calibrated within 60 days prior to the performance of the resistance tests. The metal-to-metal resistance from panel to supporting pedestal shall not exceed 10 ohms. The resistance between the wearing surface of the floor covering and the ground connection, as measured on the completed installation, shall be in accordance with paragraph FLOOR COVERING.

3.3 FIRE SAFETY

An automatic detection system shall be installed below the raised floor meeting the requirements of NFPA 75 paragraph 5-2.1 and shall sound an audible and visual alarm. Air space below the raised floor shall be subdivided into areas not exceeding 10,000 square feet by tight, noncombustible bulkheads. All penetrations for piping and cables shall be sealed to maintain bulkhead properties.

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